BIOTRON

Fully transparent personal data analytics platform empowering individuals and organisations

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Executive Summary

Abstract: Biotron gives users control over data they create and helps them benefit from it both directly and indirectly. It enables companies to make informed decisions based on data with unparalleled quality. Biotron's vision is to enable innovation by breaking down data silos created by giant IT companies. Privacy, transparency, and trust are the core values of the company.

Everyone using the internet today creates a digital trail of information. Every search, post, location, purchase, like, view, and click, is recorded. The average internet user generates ≈ 0.5 GB of data every day. This amount increases about 45% annually. Giving away some of our personal data to free digital services (e.g. Google or Facebook) is acceptable because they mostly provide improved customisation to their services which can be useful (e.g. hotel/restaurant recommendations based on location, advertisements or posts from recently/frequently viewed sites and pages, etc.). However, there are other secretive and unscrupulous players already collecting and processing your personal data. These players are generating revenue from selling this data to consumer oriented companies. Revenue that you will never receive a share of.

They're generically known as data brokers or resellers and they capitalise on monetising personal information without you ever knowing about it. They operate without our transparent consent and offer zero compensation to us - the data producers. These companies work behind the scenes collecting, processing, and sharing our information to make a profit for themselves; never disclosing that our information is being used for this purpose. Privacy and control over personal information is being taken away from individuals and sold to companies who benefit from consumer behavior and data analytics. Due to a fundamental lack of transparency, these data brokers have limited access to official and trustworthy data sources. They generate data with accuracy rates as low as 50% within datasets. , They use ineffective and cost-inefficient processes, often with multiple intermediaries between data collection & data analytics. Their methods lead to mistrust among their clients and the general public.

Biotron focuses on helping individual users to fully and independently control their personal information and participate in the process of defining its value. Biotron offers the most accurate and actionable insights into personal data for businesses engaged in the study of behavior and data analytics. Eliminating data collection and processing middlemen leads to enhanced marketing, commercial, research, and innovation decision-making, . Additionally, Biotron is using blockchain technology to limit associated legal risks and streamline processes. The blockchain provides a robust mechanism for transparency and for facilitating instant micro-transactions.

To achieve our goal, Biotron is building a user-permissioned and revenue sharing data analytics platform. User data is collected, analysed, and saved in a set of analyses, which are then available for purchase by interested parties. A smart contract is created ensuring that accrued revenue is distributed among participating users in the purchased analysis, leaving Biotron its commission. We provide the most accurate user analytics to help organisations make timely and correct decisions while benefiting from blockchain transparency.

Keywords: personal data, consumer analytics, blockchain, transparency, data broker, individuals

1. What are the current problems with personal data?

1.1. Problem

The current state of the data market is problematic both for users (data producers) and customers (data consumers), the main issue being transparency. Even though there are hundreds of companies operating in this space worldwide, actual knowledge about what happens with collected data is difficult to find.

Personal data generated by users	**?**	Processed personal data used by organisations

The average user creates roughly 0.5 GB worth of data each day – whether it's likes, tweets, location data, or transactions. This amount is increasing by 45 % each year and there are no indicators that this growth will slow anytime soon. This data is collected by numerous companies, some of them operating on the verge of anonymity. Their concealment means that transparency and privacy is almost impossible. Users meanwhile, receive no clear or direct benefit from the collection of their own data.

Customers who wish to license users' datasets are struck with similar problems. Although there is a clear competitive advantage in analysing these datasets, the legality and morality of it (due to the way it is collected) can be questionable. Pricing models are also a factor, although the value of user data has been decreasing due to increasing supply, there are many companies that do not even try increase the value of their datasets. Such companies are mere resellers that on-sell the data with no added value whatsoever.. These data brokers and resellers all take a share, which in turn increases the acquisition cost of a dataset.

The personal data providers' perspective

Users are the producers and de facto owners of the datasets. They do not have the tools to control what happens with their data and generally do not receive even benefit from it directly.

- Even a thorough investigation of the Terms & Conditions and Privacy Policies of the online services (mobile applications, websites, etc.) you use wouldn't reveal much in terms of what's happening with your data that they collect.
- If transparency cannot be achieved, neither can privacy. When a mobile application collects your data and licenses it to a reseller for further distribution, you effectively lose complete control over what happens next. And so do the companies that license your data in the first place.
- Your data is very valuable. However, a far greater value comes from processing and analysing the datasets of hundreds, thousands, and even millions of users. Therefore, it is almost impossible to get any relevant value if you'd like to monetise your data alone.

The personal data consumers' perspective

- The same transparency issue can be applied to the customer side as well. Where does the data come from? Do the users know that I'm licensing their data? These are questions that must be asked and in most cases the answer is"no".
- The availability of datasets is increasing. There are a lot of aspects that miss the ground truth, which affects the quality of the outcome. When the World Privacy Forum did a study on the accuracy of Acxiom's data, they found it was only around 50 %.
- Data takes a long journey to go from the user to the customer. Within the funnel there are many companies which take their share. Most of them do not increase the value of the dataset, they just on sell it as is. This increases the costs for which the customers license the final product.

These are just the most common problems when dealing with data – whether personally identifiable or not. The more you dig and the deeper you look at specific applications, you can find many more.

Personal data processing funnel

How could a user of digital technologies contribute to the creation of a better world by sharing his personal data and being transparently rewarded for it?

How could organisations access more transparent, accurate, and contextual personal data analytics while remaining fair to data producers, limiting compliance risks, and optimising data prices?

1.2. Current unsuitable alternatives

The personal data providers' perspective

Users generally have two options in how to approach monetisation of their data. They can sell it directly, however, it's proven to not be very beneficial:

1. Federico Zannier made USD 2,733 by selling his data for USD 2 per day on Kickstarter. He had to share his keystrokes, mouse movements, and even a screenshot every 30 seconds.
2. Shawn Buckles auctioned his data and got GBP 288 from The Next Web, which used it for experimental purposes. He had to share everything from browsing history to email conversations.

The second "option" is to simply ignore the fact that their data is or can be monetised in the first place.

The personal data consumers' perspective

There are also two ways customers can deal with this problem. They either generate it in-house or rely on the current inefficient solutions

1. Relying on current solutions means you'll be wasting your budget and resources because the data is incomplete and impure. In some cases, it can even pose a legal or PR threat to your business.
2. As good as it might sound, the cost of creating data analytics in-house, from data collection right through to actionable insights, would be astronomical.

2. Biotron's solution

2.1. Unique Value Proposition

We can all agree, that data is a new form of currency. It is essential for innovative solutions to real-life problems - from unacceptable traffic conditions in major cities to the improvement of health globally. But how can we share our data to relevant researchers while still keeping transparency and privacy at the forefront?

Biotron proposes a solution where individuals – data producers – can choose where their data will flow and under which conditions, so the customers – data consumers – can innovate and start to solve problems. The motivation for users will be direct (monetary, as part of the revenue will be shared back to them) and indirect (by helping to solve larger societal problems). Customers will be motivated by the incredible accuracy of the data-sets and the subsequent analyses created by them. This is thanks to the fact that users will voluntarily contribute their data automatically and manually (through profile details, surveys, etc.).


(13)
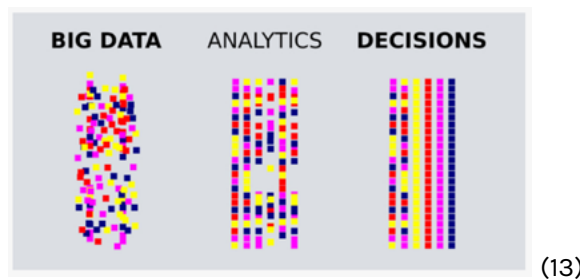
Biotron will create both mobile and web applications along with web browser extensions. These tools will collect the necessary data and serve as an interface whereby users can control the flow of their data and see how much they have earned from sharing it.

Customers will be able to consume these datasets either through specific analytics apps or APIs.

This solution commits to 3 unique values:

- **Transparency:** Our emphasis on transparency instills trust in Biotron from both the user and the data customer. Trust that is currently lacking within the market. A user knows when and how their personal data is processed and businesses can trust the quality and the source of the datasets. To reinforce transparency, Biotron uses the benefits of the blockchain as its main support function.

- **Quality:** Biotron integrates multiple and diverse data sets from individuals to provide a complete view of their transactions, contexts, and circumstances. This creates a genuine all encompassing view of the user, unconstrained by organisational data silos. Biotron generates new user insights from new angles which can help fine-tune offerings and drive innovation.

- **Cost efficiency:** By eliminating data buyers, resellers and brokers from the data collection and sales funnel, Biotron significantly reduces the data acquisition cost. Biotron's main economic contribution is a reduction of the many layers of waste currently embedded in how organisations and individuals go to market and do business with one another.
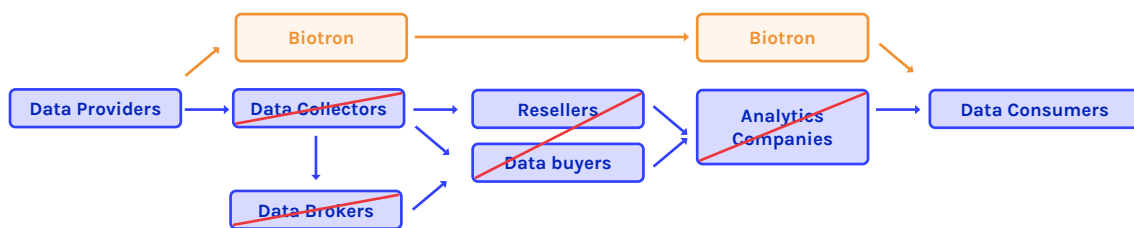
Biotron's personal data ecosystem

2.2.   Data provider interface

Users - data providers - can share their data through web and mobile applications and web browser extensions. To access information about their account and control where their data flows they can also use a web application. Key components are:

- clear and transparent communication on what and how Biotron collects data;
- interesting statistics and other insightful information;
- clear wallet balance and compensation calculation

Biotron is FREE to participate in for data providers. Data storage and processing costs are covered by Biotron Foundation.

Transparency, Control & Privacy

By design, the system gives individuals complete **control over their own data**. Biotron provides actionable insights for users. The service makes clear that all personal data stored is owned and under control of the individual user. User data can be exported or deleted on demand.

Pseudonymisation also takes place. It is a procedure whereby any identifying characteristics of data are replaced with a value which prevents the individual from being directly identified.

To achieve the ultimate **transparency** across data usage and transactions, we will use a public ledger - blockchain. Two key requirements are facilitated by characteristics of the underlying blockchain technology:

- **Public** - The ledger has to be publicly available to everyone within the system. Everyone should see, transparently, how their data contributed to the data analytics sold to customers.
- **Smart Contract** - A smart contract is a publicly available contract in the form of code. It ensures the transparency of reward distribution to data producers depending on their data usage within the analysis. Once the consumer decides to buy an analysis, the system will create an instance of a specific smart contract related to the type of data set (e.g. geolocation data) required. One of the nodes within the blockchain system will take care of the contract instance and write the result of the contract to the chain. The result of the contract is usually a transfer of BTRN tokens from one party (data consumer) to several parties (data producers).
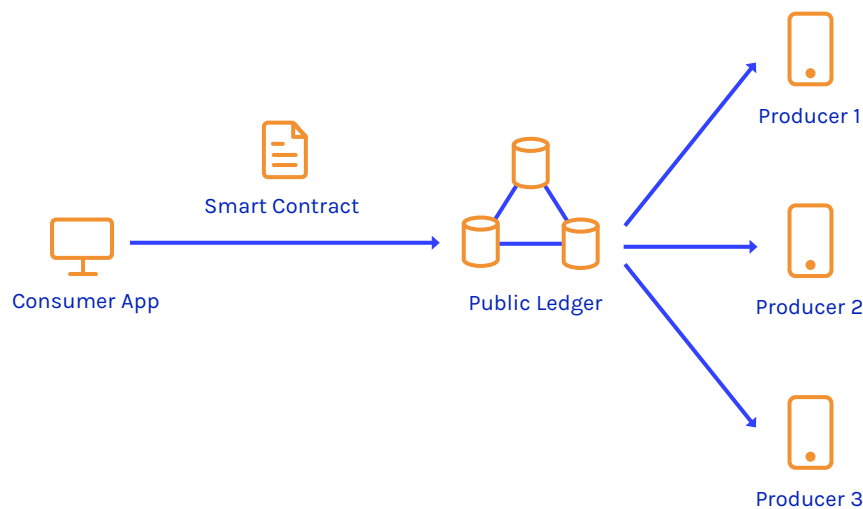
2.3. Data consumer interface

Data consumers can use the Biotron web applications and APIs to request data analytics, or the raw data itself.

Types of data used for analytics

We can categorise data using different attributes: by user involvement (passive vs active) or time (live vs historical). (14)

- **Passive (Observed and Inferred) Data** - is data generated without active user participation. A user just approves access once (e.g. sensors, 3rd party API) and the app or extension observes behaviours or surroundings. For example, data generated from temperature sensors, from Facebook or Twitter APIs, or from GPS enabled devices.
- **Active (Volunteered/Declared) Data** - is data that requires active user participation and a specification on their behalf. For example, accident reporting or answers to surveys.
- **Live Data** - is data generated in almost real time within streams. For example, live traffic information about route throughput or live traffic information about an accident.
- **Historical Data** - is non actual, historical data. For example, historical temperature data or historical aggregated geo-location data.

Producing analysis and metadata

In order to target data from specific producers by the data consumer, we sanitise data and store metadata about both the raw data and the analysis. This allows us to calculate each data producers' contribution to the final analysis. The data flow is as follows:

1. Data is generated by a person or device.
2. Data is stored within short term storage (buffer).
3. Data is aggregated, filtered, and mapped (transformed) then the final analysis is stored.
4. Raw data is stored in long term storage for later usage. The metadata about a data producer is stored within a structured storage.
5. Short term storage is flushed (cleaned).

The strawman diagram below shows how data flows within the system from producers (people or devices).
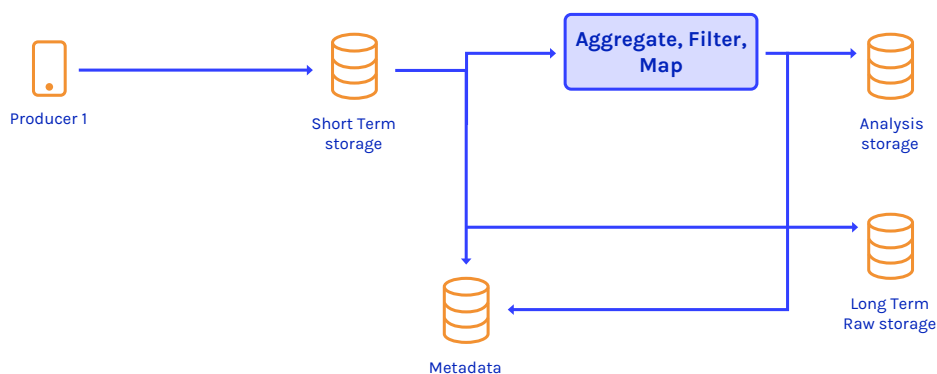
Steps to buy analysis

1. The customer selects analyses depending on metadata.
2. A smart contract is initiated according to specific parameters (list of users, type of data, price, etc.)
3. The smart contract invokes transactions and grants access to analyses storage.
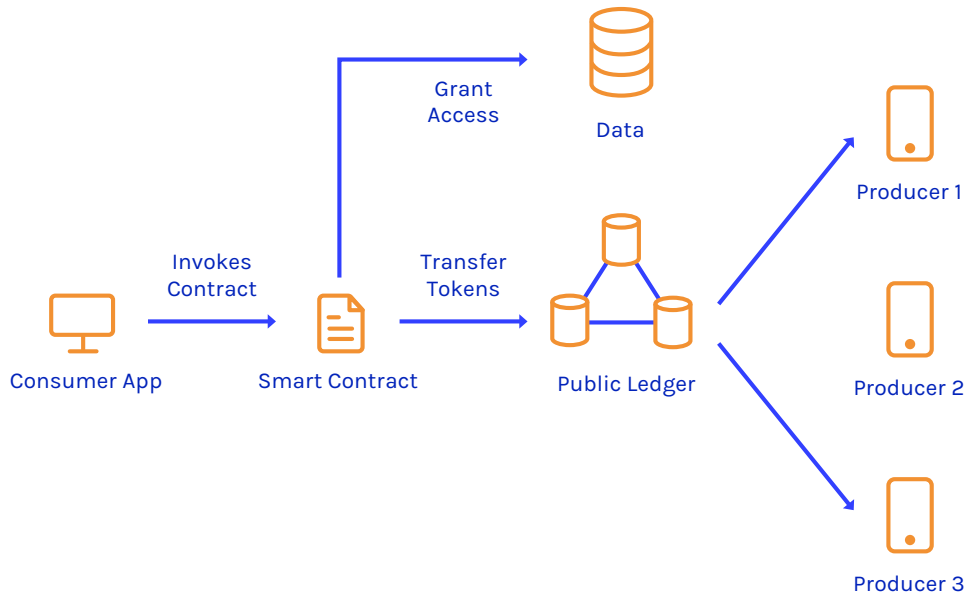
Types of analytics & surveys

Organisations are provided with automated, manual, and qualitative research (surveys) analytics of four types of big data applied to Business Intelligence: (15)

- **Prescriptive**. This type of analysis reveals what actions should be taken. This is the most valuable kind of analysis and usually results in rules and recommendations for the next steps.
- **Predictive.** An analysis of likely scenarios of what might happen. The deliverables are usually a predictive forecast.
- **Diagnostic**. A look at past performance to determine what happened and why. The result of the analysis is often an analytic dashboard.
- **Descriptive**. What is happening now based on incoming data. To mine the analytics, you typically use a real-time dashboard and/or email reports.

3.   # Use cases

John, who lives in London, wakes up on Sunday and enjoys his morning coffee and his favorite English breakfast. After he is finished, John is ready to change his life.

John creates a Biotron account, downloads the app, installs the web extension and links his car, thermometer, 3D printer, and other IoT devices he owns with his Biotron account. Now John has joined the Biotron nation of millions of people who make money and improve our world by voluntarily sharing their data.

How can John earn money and make our world better by sharing his data?

Thanks to John's data, Biotron is able to produce a wide range of data analytics and surveys such as:

- **Location Intelligence & Marketing**

  By analysing John's favourite places and matching it with his social demographics Biotron is able to create his profile. Aggregated profiles will give brands answers about their customer base and visitors to their stores. It will reveal detailed social demographics, including, where they work and live, how much time they spend at their and their competition's stores, a much more. Based on these insights brands are able to create actions, such as highly-targeted online and offline advertising campaigns.

- **Traffic Analytics & Smart Cities**

  Data on travel and commuting patterns is invaluable for local governments wanting to drive smart city initiatives. What are the bottlenecks, why are they appearing, are the streetlights set up correctly? These are just a few of the questions Biotron is able to answer. Taking actions based on these insights will enable cities to almost eliminate traffic congestion, improve their public transport infrastructure, and reduce costs.

- **Finance & Insurance**

  Hedge funds can use visits to stores and overall activity trends to predict how markets will evolve and what will be the performance of specific companies. Insurance companies can get qualified leads for buyers of vehicle, home, health or travel insurance, premiums.

- **Health**

  Analysing data from smart watches and wearable technologies will enable Biotron to predict specific health conditions, leading to an overall improvement in population health. When combined with DNA analytics, Biotron analyses will be at the cutting of preventative healthcare.

- **AI Training**

  Since Biotron analyses will also have data input manually by users, it will provide direct first-hand data and high quality training datasets for AI mastering.

These high quality and accurate data analytics ultimately become powerful "predictive" tools. By harnessing different methods and techniques across data mining, machine learning, and other methodologies for analysing collections of historical events and transactions, Biotron will deliver never before achieved insights into predicting future actions and outcomes.

For example, the healthcare industry looks to use predictive analytics to assess patient risks (such as developing certain conditions or diseases). Another example is credit scoring, used in the financial industry to predict whether an individual is more or less likely to default on a loan. In a retail sales process, a predictive model might be used to determine a customer's likelihood of making a particular product purchase at a specific time.

Biotron helps organisations and individuals to drive administrative efficiencies, identify patterns and trends, gain new insights, make better informed plans and decisions, organise, coordinate and orchestrate complex tasks and processes.

4. Market

4.1. Market opportunity

4.1.1. A Market to disrupt

The global market of personal data is on the rise, with the transparency of data processing at the forefront of recent discussions, notably with new coming legislations such as the General Data Protection Regulation from the European Union.

Firstly, generated personal data is on an accelerated upward curve. The average Internet user generates 0.32 - 0.77 GB (1)(2) of data every day with an annual increase of about 45% (16). Additionally, the awareness of the value of personal data is also increasing among users of digital technologies, especially among younger generations. Research from the analytics firm SAS revealed that 69% of millennials consider their personal data to be a "bargaining chip" which can be leveraged to better enhance their life. (17)

In a vast and fast growing personal data market, we usually only think of social media sites or tech giants such as Facebook and Google. However, they are just the tip of the iceberg. The main players are spread over an entire channel of data processing: from collecting, analysing, selling, and reselling. Their main source of revenue is only from the processing of personal data. This part of the market is usually categorised as the "Data Brokers' Market". However, the main players are not just simply doing data brokerage, but also collection, resale and analytics. (18)

This global data broker market is targeting multiple segments: advertising and marketing, credit and insurance, company performance measurement, product development and innovation, identity verification and fraud detection, healthcare, education, government and institutions, and also directly to consumers as a service. (19)

Biotron's mission is to bypass data resellers, buyers, and brokers, to instead collect and analyse personal data straight from the source. Biotron deals directly with data consumers, such as brands, to provide personal data analytics. Biotron does not get involved with simple data brokerage. At first, Biotron is targeting the marketing and advertising segment. We can define it as the customer analytics market. Next, Biotron will be able to extend to other market segments.

A 2017 report published by Transparency Market Research reveals that the global data broker market is expected to show a Compound Annual Growth Rate (CAGR) of 11.5% from 2017 to 2026. Consumer Data emerges as the leading data category,y it currently accounts for around 36% of the revenue share within the market. (20) The segment of consumer analytics devoted to marketing activities is also growing fast with a CAGR of 15%.

Customer Analytics Market (21)
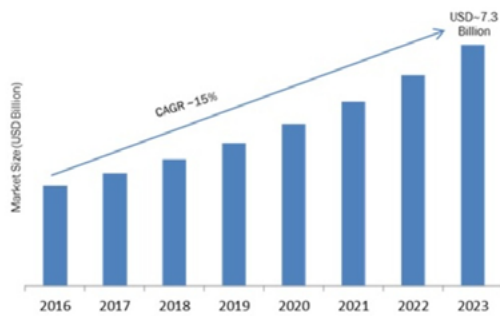
North America and Western Europe (UK, France and Germany) generate the largest contributions by revenue to the customer analytics market
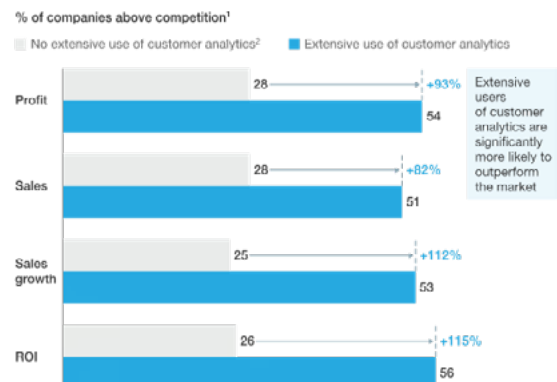
Customer analytics has a great development potential ahead given that it has already proven to be extremely useful but is still underestimated and underused. A study from McKinsey & Company, that surveyed 700 senior marketing and sales executives, shows that marketers still don't count the use of customer analytics as critically important for commercial success. However, executives that are extensively using customer analytics are convinced of their strong performance. 85% of companies that use customer analytics extensively, claim they achieve a significant added value. (22)

The segment is mostly driven by 2 factors

1. Consumers have growing access to information. Successful offers will come from more accurate consumer behavior predictions that will be generated thanks to a deeper understanding of customers' buying habits and lifestyle preferences.
2. Better customer profiling is requested by marketers. Current profiling techniques are mostly based on algorithms that guess the best customer profiles, but reports have shown up to 50% inaccuracy in these datasets. (23)

4.1.2.   Legislation in favor

The personal data market has been evolving, regulatory wise, in recent years. Several instances have been driving government regulation of the market, including: personal data breaches that highlighted the little regard data holders have for their protection of users' personal data, the awareness of the great monopolies held by tech companies that hold personal data at the core of their business models, the misuse and even abuse of personal data from data brokers and analytics companies. Governments are pushing for greater transparency, accountability, and a strong code of conduct. Alongside governments, the general public also has growing concerns about their personal data protection and their role within the data market.

In the European Union (EU)

The GDPR will have a major impact on the EU data protection landscape and significantly impact data brokers. The regulation is calling for more control and transparency of personal data and will be applicable from the 25th of May, 2018. (24). With respect to the data broker market specifically, the GDPR introduces:

- explicit consent when processing sensitive categories of data (GDPR, Article 9)
- clear opt-out provisions in the GDPR for direct marketing, and profiling for direct marketing (GDPR, Article 19)
- restriction on profiling and automated decisions (GDPR, Article 20)
- right to data portability (GDPR, Article 20)
- a certain degree of data normalisation and interoperability: API, same format, etc

In particular, it is worth highlighting the included 'right to data portability'. It allows users to obtain and reuse their personal data for their own purposes across different services. It enables them to take advantage of applications and services that will use this data to find them better commercial deals, or help them understand their spending habits. The GDPR is notably insisting on a certain data normalisation between services: "Personal data must be provided in a structured, commonly used and machine readable form and free of charge". Organisations must respond without undue delay, and within one month. (25)

Biotron will provide tools for simplifying this process and allowing Biotron data providers to conveniently request the companies which collect their personal data to provide them to Biotron so they can be included in a data provider's Biotron profile.

In the banking sector, the EU is also getting involved by giving more rights to banking customers. The Payment Services Directive 2 enables both, customers of banks and businesses, to use third-party providers to manage their finances. Banks are therefore obligated to provide open APIs to third-party providers to access customers' accounts, giving the possibility to build financial services on top of banks' data and infrastructure. Credit cards transaction data will therefore be accessible via the users' clear consent. (26)

In the United States

Even though the US is more relaxed in their approach to personal data protection, several regulator bodies have started to raise concerns and call for greater transparency and control, especially towards the data brokerage industry and their marketing practices. The U.S. Government Accountability Office (GAO) and the Senate have shown that the current regulatory framework is outdated and does not include the latest technologies for profiling and tracking.(27)(23) The Federal Trade Commission (FTC) already pressed the US Congress to regulate data brokers involved in marketing activities: "to provide consumers access to their data, including sensitive data held about them, at a reasonable level of detail, and the ability to opt out of having it shared for marketing purposes." (5)

4.2. Customers

4.2.1. Personal data providers

Users
-   Users of digital technologies generating personal data such as smartphone, computer, internet, and other connected devices
-   Users looking to control and manage their personal data
-   Users demanding improved transparency on their data processing
-   Users looking to create a source of passive income by sharing their personal data

Biotron users will have to be of legal age under their respective national law. Globally, Biotron won't collect any data from any children below 13 years of age.

Application developers

Developer of a consumer app can install Biotron's SDK to share their users' personal data with a strict transparency clause that can be concretised by an official Biotron Label, and under strict conditions:
-   Their users are notified transparently and clearly
-   Their users have the choice to opt in or out
-   Their users receive some sort of rewards/cash (such as in-game coins, discounts, etc.)

The gaming industry is a good example of this type of a customer. They generate a lot of data from a large user base and they could compensate their users easily with in-game rewards or cash.

4.2.2. Data analytics consumers

Biotron's clients are any businesses, from large corporations to small and medium businesses, involved in the study of personal data and consumer behavior analytics. Governments, institutions, and research organisations are also consumers of this kind of analytics. Industries interested in customer analytics such as consumer brands, e-commerce and retail, telecommunications, travel, insurance and banking, media, healthcare, and more. As well as customer analytics, hedge funds and banks are keen on credit card transaction analytics to predict market fluctuations. Organisations such as cities are very interested in location intelligence data to improve their infrastructure. Artificial intelligence companies are also looking for as much data as they can gather to improve the machine learning of their systems.

4.3.   Competitor overview

Biotron uses personal data to provide a **user incentivised analytics platform**. Therefore, Biotron positions itself between other standard customer analytics and market research firms, and simple personal data marketplaces that incentivise their users directly.
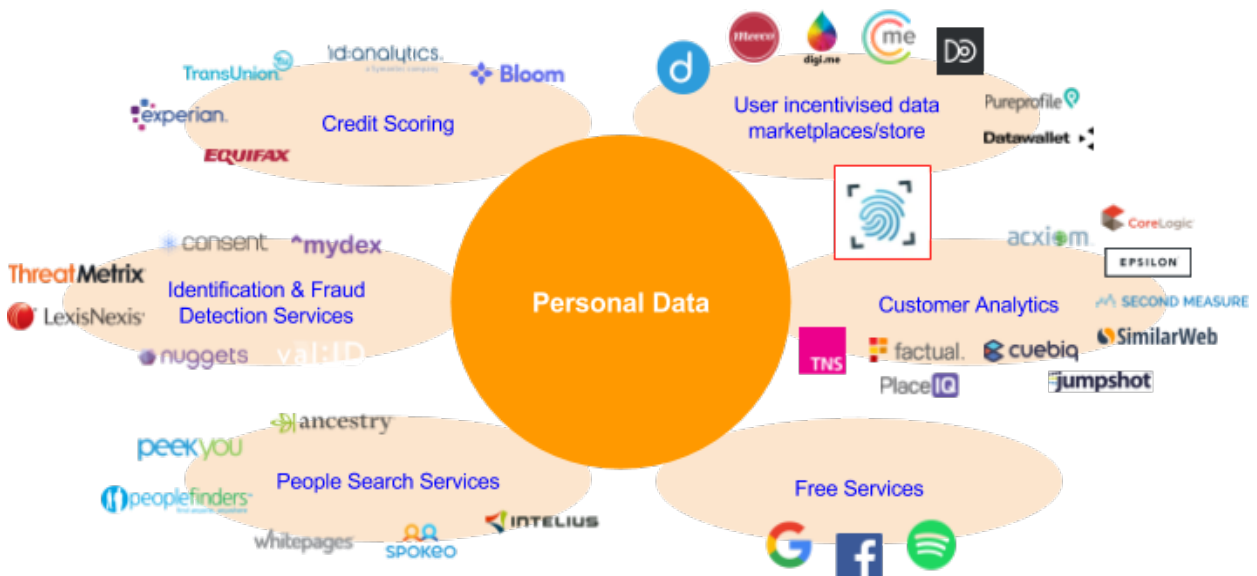
Customers Analytics. Collect personal data that is publicly available or from partner companies they then clean, analyse, and sell analytics to brands. This includes audience analytics, location intelligence, transaction analytics, and market research.

User incentivised Data Marketplaces. Incentivise users to store and/or share their data with them, they then resell their user's datasets.

Credit Scoring..Publicly available personal data is collected from partner companies to provide risk credit scores.

Free services. Free services (e.g games, software) are provided in exchange for the processing of users' personal data to improve the service or to use for in-app advertising.

Identification & Fraud Detection Services. Provide identification systems by accessing third party services to aid in the detection of frauds.

People Search Services. Users provide personal information such as age, name, address, etc.

4.4. Competitive advantage

In the customer analytics and market research segment, Biotron offers analytics based on data of a higher value, complexity, structure, and detail. This is reinforced by placing information in context, thus far superseding specialised analytics companies and personal data marketplaces. This makes Biotron

- the only transparent platform from data sourcing to data selling, instilling the complete trust of the general public
- the most qualitative analytics platform with multiple incentivised data sources and no issue for profiling accurately, leading to trust in Biotron's data
- increased cost efficiency by collecting data at the source and cutting out brokers and resellers

Compared to user incentivised data marketplaces, Biotron is focusing on higher value analytics rather than simply the resale of datasets. Users' personal data is more secure and never directly exported. Incentives also have higher value in the long term.

Finally, our revenue share business model and transparency is a philosophy that data brokers will struggle to implement in their current system.

5. Go to market strategy

5.1. Product Phases & User Acquisition

5.1.1. Phase 0 - Prototype

In the preparation phase, Biotron will focus on product validation and fixing the "chicken-egg" problem. The solution is to acquire location data from 3rd party marketplaces, POI data from providers, and creating the first custom location intelligence reports for customers. The first revenue will be already generated and attributed using advertising IDs, which will be kept in the database.

Components created:

- Data core on the cloud
- Revenue attribution
- Location intelligence reports

5.1.2.   Phase 1 - MVP

After successful validation of the output for customers, we will create a self-service web application where custom reports can be created. The mobile application where users can already see their balance is launched. At the same time it can collect data, which will power the MVP. The key here will be to attract the early adopters. Their early enthusiasm and motivation will allow Biotron to get the first feedback that contributes heavily in defining future product development. Geographically, the biggest markets for analytics of personal data are the US and Western Europe. Being based within European Union, Biotron focuses first on the UK, France and Germany. The US will be targeted once a solid basis has been settled.

Profile of early data providers:

- ITE participants
- Crypto and blockchain enthusiasts
- Users of digital technologies concerned about the control and the protection of their personal data
- People that are looking for a passive income like students or young entrepreneurs

Profile of early data consumers:

- Companies that are actively looking for an alternative to traditional data brokers and analysts
- Small and medium companies within the Biotron team network that are able to test new solutions to analyse consumers' behavior

Components created:

- Mobile app wallet with data collection
- Self-service web application for customers

5.1.3.   Phase 2 - Microtransactions

After the successful launch of the Biotron app it will be crucial to enable users to be able to cashout their earnings. Thus we will focus on the blockchain layer, which will enable us to distribute the generated revenue proportionally to our users.

Components created:

- Blockchain layer

5.1.4.   Phase 3 - User web application & extension

To complete the user-side of the product, Biotron will launch a web application and browser extensions that will allow users to control their data on the web. Also, it will allow us to collect data from the browser to further improve the quality of our datasets.

5.1.5.   User Acquisition

Several strategies are implemented to create and expand Biotron's personal data provider base. The Biotron App and partnerships with B2C companies, such as gaming companies, are the 2 main paths to acquire users.
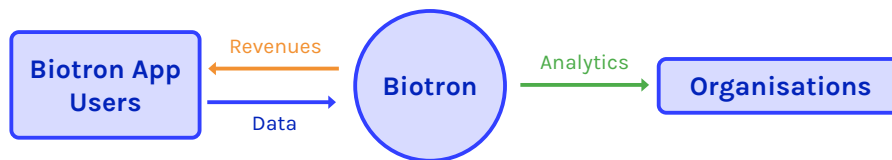

Strategy 1: Biotron App

Biotron App user base building
- Word of mouth. The first and most important thing is to work heavily on user experience and community management. A satisfied user who is happy about his experience is the most convincing person to evangelise Biotron. Gamification can be employed as a reward for active users. Active community members can become brand ambassadors.
- Referral program. Users will be incentivised in BTRN tokens to invite friends to join the app and be part of the community. Such a system eases and accelerates word of mouth.
- Initial Token Event. Participants will be the first users and the communication created to support the token distribution will help in spreading the brand's messages to the general public.
- Growth hacking:
    - SEO optimisation
    - Paid promotional methods (Google universal app campaigns, Google and Apple Search ads, Facebook and Twitter install ads, etc.)
    - Incentivised traffic networks
    - Social media presence and content marketing

Biotron general personal data provider base building
As mentioned in 4.2.1, developers of B2C products or services can install Biotron's SDK to share their users' personal data with strict transparency and compensation clause. For companies, it is a new monetisation strategy. For their users, it would be not only a sign of trust and transparency, but also an enhanced user experience thanks to the compensation offered.
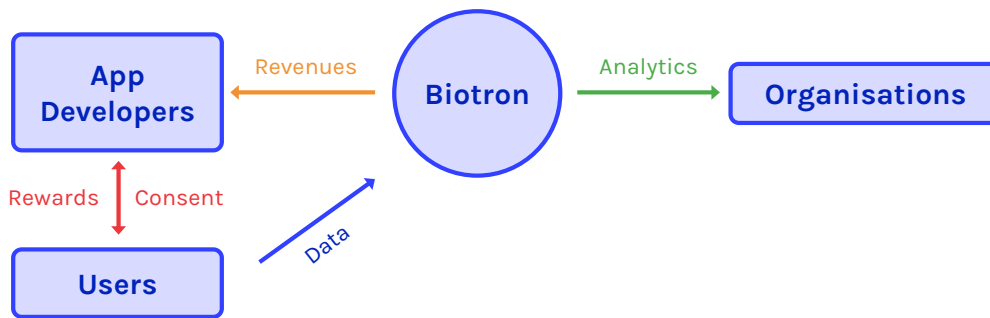
Strategy 2: Biotron's B2C partners

5.1.6.   Business clients

The expansion of Biotron's client base starts with the strategy of acquiring personal data providers via B2C companies. The latest are the first ones to be aware of the analytics service and are in direct relationship with Biotron. These partners will constitute the initial client base.

To reach further potential data analytics clients, two other proven B2B go to market strategies are implemented, depending on the size of the company targeted::

- A direct sales team for large and medium companies. Direct relationships are crucial for key account management.
- Online marketing campaigns for smaller companies.

5.1.7.   Acquisitions

While Biotron will provide unique competitive advantages and tools for all sides (data providers, data consumers, researchers), we do acknowledge the power of corporate acquisitions when planning and executing user growth and brand recognition. Therefore, we will carefully analyse opportunities in the personal data market field and evaluate possible future targets, which would fuel our rate of growth and reach the goals and milestones as fast as possible. We will also be open to future partnerships with existing companies dealing with personal data, and support both professional and public communities to achieve the highest level of transparency, data quality, and best pricing for both data providers and data consumers.

5.2. Business Model

Biotron generates revenue via a subscription fee for access and pay per analysis models. Revenues are shared with data providers and Biotron receives a commission.

The more users sharing personal data increases the value of the data analysis and lowers the User Acquisition Cost. Analytics products are the first step, while future revenues can be generated by products and services built on top of the personal data warehouse.

Below are the planned main costs and revenue tables for Biotron.

Costs	Revenues
• Initial Token Event and distribution • Technical development in house • Data storage • User acquisition: referral program and growth hacking • Business account acquisition: sales team and customer support	• On-demand services: pay per analysis • Subscriptions to the analytics service (monthly, yearly)

To measure growth, Biotron tracks the following key performance metrics:

Data providers	Data consumers
• number of users sharing personal data • User growth and churn rate • Average size of daily data collected per user • Average revenue redistributed per user • Average of data requests per user	• number of businesses subscribed / # of buyers • Daily/monthly sales • number of transactions (daily/ monthly)

6. ## Team

Pavol Magic
CEO

Pavol's expertise is turning data into products and developing new revenue streams as he notably did within Sygic for more than 6 years. He creates value from both green-field and late-stage products. He has managed teams from 3 to 60 members and worked within sectors such as IT, telecommunications, and FMCG. His experience includes brands such as Dell, Motorola, Henkel, Heineken, Siemens, and many more.

Martin Smolka
COO

Martin is a business professional with a history of delivering products, projects, and goals. After more than 9 years in digital and software development in various companies including Avast, AVG, and General Motors, he became captivated by the startup company DECENT, where he led product development.

Peter Dendis
Co-founder & CMO

Peter brings over 10 years of entrepreneurial spirit and online marketing expertise, including the successful exit from his own agency, Tarantula. He joined the blockchain startup DECENT, serving alongside the co-founders as Head of Marketing, and most recently led the ITE team for SophiaTX which raised nearly USD 23 million in December 2017.

Slavomir Kubacka
Co-founder & CTO

Slavomir brings experience from emerging tech development and architecture. He most notably worked with Hyperledger Fabric at Accenture and in software development at CERN.

Pierre Charvet
Head of Business Development

Pierre joined the team from day one benefiting from his international business development experience gained while working with the company builder and investment company NOVA Founders. He also co-founded two entrepreneurial projects and he is an avid enthusiast of the crypto market.

Peter Sima
Head of Digital

Peter is a Google Adwords certified professional with a background in search engine marketing, web analytics, and conversion funnel optimisation. He worked on a variety of campaigns from multi-million dollar global mobile app user acquisitions to NPO and startup client campaigns. Transparency and fairness are his top life and business values.

Jonathan Der
Head of Data

Jon brings over 10 years of experience in analytics and economics. Lately, at Johnsons & Johnson, he led the senior analytics team in the development and deployment of data visualisation tools. Before that, he spent 3 years in AVG Technologies as a senior online marketing analyst.

Andrej Botlik
Business Intelligence

Andrej holds years of experience in helping clients manage their business to achieve high performance. He focused on management consulting in sales, marketing, customer service, CRM, financial management, and investment support.

Pavol Hudec
Project Manager

Pavol has great experience in project management thanks to two entrepreneurial projects he founded. In his free time, he likes designing and implementing creative ideas, as well as optimising processes and increasing efficiency.

Advisory board

Dr. Marian Podmajersky
Blockchain & Solutions Engineer

Marian's first IT endeavours began in the second grade when he started programming in Pascal, Basic, and Borland C. As a teenager, he built and repaired custom PC setups and reinstalled Windows. During his Masters and PhD program, he conducted research in 4 Universities: mainly at the Slovak University of Technology, ENSIC INPL in Nancy (MSc), EPFL in Lausanne (PhD) and McMaster in Hamilton (PhD). As a software designer and developer, he became familiar with blockchain technology by working on several projects that required security, distribution, and redundancy of data. Since then, he has worked on concept proofing, mining on multi-GPU setups, and on further exploration of the blockchain technology.

Igor Strecko
Infrastructure Advisor

Igor is an entrepreneur and online business developer. He co-founded the web hosting and cloud company Webglobe and is the CEO of Webglobe-Yegon. In 1999, while still a student at the University of Economics in Bratislava, he began creating websites for clients. Soon after, Igor focused solely on providing web hosting services and Webglobe was born. It was the first web hosting company in Slovakia that integrated a professional cloud solution. In 2014, Webglobe partnered with Yegon and now Webglobe-Yegon is one of the biggest web hosting companies in Central Europe. Igor is responsible for the strategic management of the business, focusing on product and business development, and marketing. He is passionate about sharing his experience through consulting and advisory services to a variety of technology brands.

Lubomir Jakubek
Corporate Governance

Lubomir is an experienced auditor in asset management and financial services with a demonstrated track record in banking, insurance, pensions, asset management, oil & gas, and external auditing processes. He is skilled in enterprise risk management, fund management, treasury, and data driven auditing. Lubomir holds a PhD. focused in internal audit from Paneuropean University. He is passionate about capital markets, blockchain, cryptocurrencies, and technology.
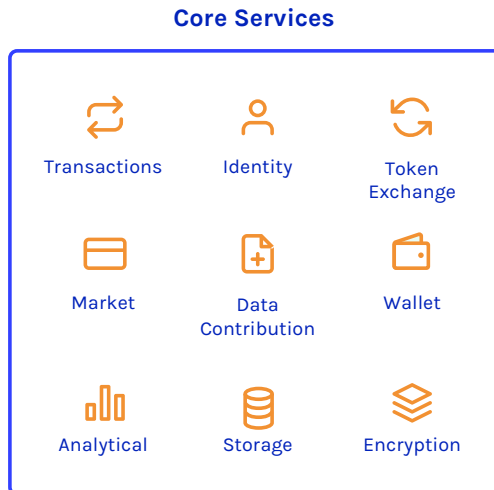
Milan Gajdos
Corporate Strategy

Before joining the blockchain world, Milan spent 13 years in the strategy consultancy division of KPMG, specializing in global corporate strategy, corporate governance and operational excellence. He headed a highly exposed department dealing with new strategic initiatives, marketing and product strategies, innovative ways to approach customers, revenue assurance models and corporate culture setups to boost overall HR effectiveness. Milan is now fascinated by blockchain and is actively looking at industries and use cases where this technology can be used to for both corporate and personal benefit, such as the area of personal data management. Milan holds an MBA degree from the City University of Seattle, is certified in a number of project management and operational excellence approaches, and further improves his qualification in a PhD. program centered around corporate process performance. In addition to traveling and various sports, he has found passion in flying and holds a pilot license for sport aircraft.

7. Architecture

7.1. Functional Components

The system will provide following core services:

Core Services

Transactions Identity Token Exchange

Market Data Contribution Wallet

Analytical Storage Encryption

- Transactions Service. Handling micropayments within the system.
- Market. Providing information about data sets, kind of information they contain, and how the producer contributed to the analysis.
- Identity. Provides authentication and authorisation and holds encryption keys.
- Data Contribution. Calculates contributions to data sets (data pool) by data providers.
- Data Storage. Holds raw data sets and analysed data.
- Analytical. Aggregates, filters, and transforms data.
- Wallet. Account services to show a user's balance and list of their transactions

7.2. Blockchain platform

As we described in the sections above, blockchain platform usage is mostly for transactions and smart contracts. Besides requirements for the public ledger and fast and cost effective transaction validation, we may need other technical and non-technical requirements. Thus far, we have compared several existing blockchain platforms and have deduced the following -

- in order to achieve a high throughput of transactions, several implementations use so-called 'permissioned blockchain', which accepts only trusted validator nodes (Multichain).

- alternative types of consensus and leader election algorithms emerge. Some implementations use so called PoS (Proof of Stake) that determine validator nodes in a deterministic way that depending on the validators' stake (as is implemented in Waves, Ark). Other algorithms randomly choose validator nodes with configurable probability and timeouts (implemented in Multichain).

- popular public platforms with smart contracts like Ethereum are not suitable for our microtransactions use case mostly because of the cost of several transactions and the limitations related to the maximum number of instructions per execution of a smart contract.

Platform	Consensus	Pros	Cons
Ethereum	PoW	Smart contract	Limits of instructions per smart contract (Gas max limit) Expensive transaction Slow speed (up to 10tx/s)
Multichain	PoW	Speed (up to 1k tx/s) Platform already tested on private implementations	No smart contract Permissioned
Waves	PoS	Speed (up to 1k tx/s)	No smart contract
Ark	DPoS		No smart contract yet

We identified the following solutions for our use cases.

1. **Build our own blockchain -** with combined PoS and Proof of Data algorithm consensus. This will have advantages like complete control over the blockchain, fees, and full transparency. Disadvantages include infrastructure and software maintenance (code modifications of existing platforms). Full transparency might not be ideal for large data consumers. We propose to use data from Biotron data streams to ensure entropy of randomisation of leader election. Each node must be associated with a producer device. Only those nodes which will meet specific condition (e.g. number of different GPS samples per minute) will be granted to enter the leader election process.

Producer
Producer   Producer
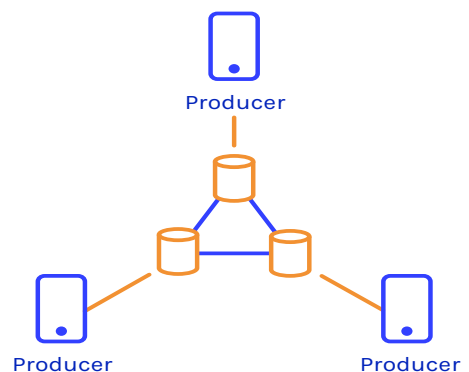
2. **Existing platform with off chain transactions** - Combinations of Ethereum with Raiden may increase throughput, we do not need to spend extra time with infrastructure and software maintenance (only minor code modifications if any). It's also a ready-to-go solution with the possibility of private off chain transactions that are faster and cheaper. On the other hand, we will lose control over fees (as with Ethereum and the crypto-kitties scenario).

3. **Alternative ledgers** - Alternatives to blockchain like IOTA promise low cost microtransactions.

Offchain Data

The tradeoff that comes with transparency within blockchain is the cost of data storage. Each new ledger record is replicated within the network of nodes (validators). This is fine for small data structures like transactions but not useful for larger and more complex data structures. Solutions that store only hashes of data sets on blockchain but store data outside blockchain (off chain) seems promising but there are several challenges while storing data in distributed storage solutions like IPFS. Since network nodes can join or leave any time this can cause loss of data (redundancy issues) or issues with service level agreements (SLAs) for end users. Replicating data sets to each node within network would be inefficient and costly
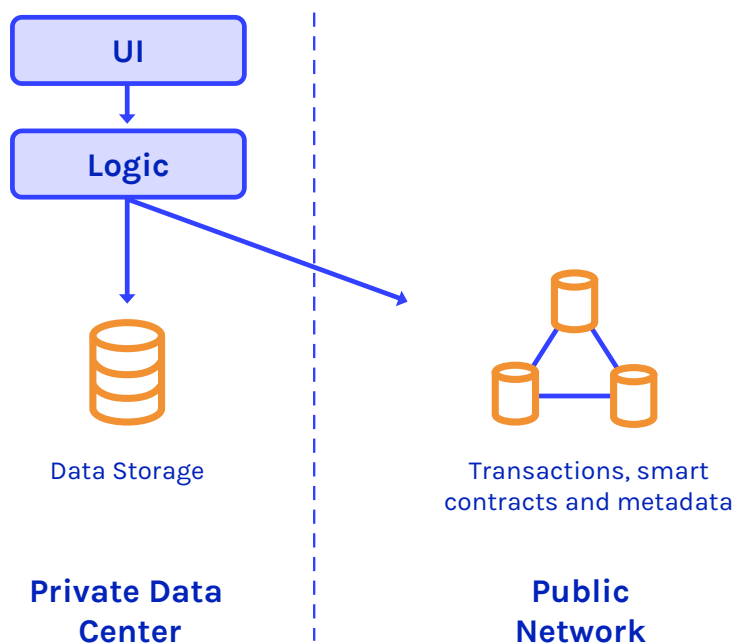
In order to achieve a balance between transparency, efficiency, availability, and data redundancy, we decided to store raw data sets and analyses outside blockchain (off chain) within private data centers applying the highest security measures and techniques. Biotron keeps just the transactions, smart contracts, and metadata public.
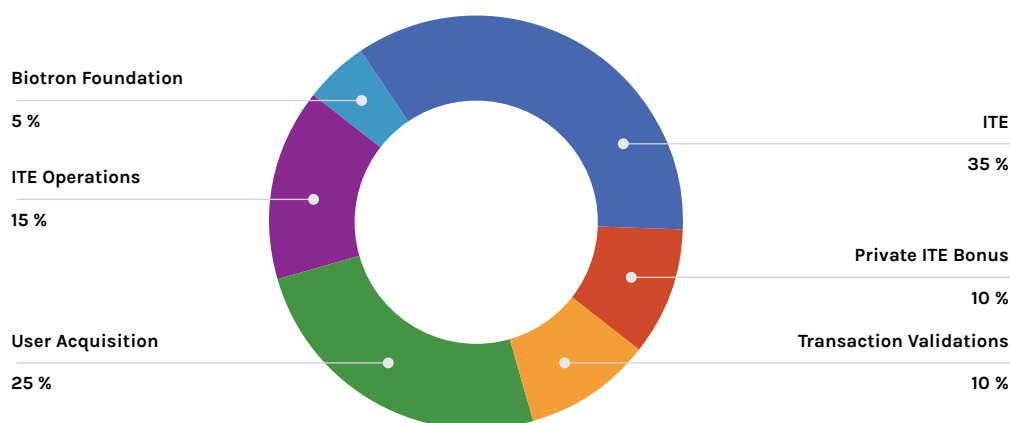
7.3. Token function in the product

BTRN is a utility token that enables the trade of data between data providers and consumers. It is the only option for data consumers to pay for access to data and the only method by with they can compensate their providers. The BTRN token is also used to cover transaction fees and rewards miners for validating transactions and blocks on the blockchain.

8. Initial Token Event (ITE) & distribution

Role of token	Enables trade of data between data consumers and providers
Symbol	BTRN
Maximum supply	1 000 000 000 (no new tokens will be generated)
For ITE	350 000 000 (35% of all tokens)
Initial Token Value	€0.10 per 1 BTRN
Public ITE period	27.3.2018 15:00 UTC to 5.4.2018 15:00 UTC
Accepted currencies	ETH, BTC, LTC, EOS, OMG, BAT, SPHTX
Token distribution	Starts on 9.4.2018

Token distribution

Biotron Foundation
5 %

ITE Operations
15 %

User Acquisition
25 %

ITE
35 %

Private ITE Bonus
10 %

Transaction Validations
10 %

- 35% of all BTRN tokens will be allocated for the ITE. The private ITE for strategic participants will start in January 2018. The public ITE will take place on the 27.03.2018 and stay open for 9 days.
- 10% of all BTRN tokens will be allocated for the private ITE bonus scheme.
- 10% of all BTRN tokens will be held for transaction validations (in case we decide to build our own blockchain/ledger). If we use an existing blockchain/ledger, it will be used to cover transaction fees on that network. For more information about blockchain implementation please see the 'Architecture' section of this document.
- 25% all BTRN tokens will be allocated for user acquisition activities, business development, and market expansion.
- 15% of all BTRN tokens will be allocated to cover the ITE operation costs (marketing, legal, and development efforts) and to compensate ITE advisors, partners, and founders (vesting period up to 12 months).
- 5% of all BTRN tokens will be held in reserve by BIOTRON FOUNDATION for future development with sales restrictions of 2 years.

The ITE will be conducted by Biotron. During the ITE the participants will receive ERC-20 based BTRN for their donations. Biotron shall engage a variety of associated parties and third parties, in order to secure the development of respective software solutions for specific IT related purposes.. Proceeds received from participants shall be used for this purpose.

During the ITE, BTRN are created as ERC-20 cryptographic tokens on the Ethereum protocol. Later, after the ITE and once the Biotron Blockchain is launched, the ERC-20 based BTRN will be replaced by the final proprietary BTRN. The participants shall, within a period announced by Biotron, remit/redeem their ERC-20 based BTRN, otherwise, they cease to exist. At that point, the participants that received the ERC-20 based BTRN shall receive their final proprietary tokens (BTRN) and the ERC-20 based BTRN will be burnt.

The public ITE shall last 9 days. During these 9 days, there will be 9 rounds, each day represents one round. The timeframe details of the exact start of the public ITE shall be provided at least 48 hours prior to the public ITE by Biotron on its website.

The ITE shall offer ERC-20 based BTRN in ETH, for accepted currency, coins and tokens, including BTC, SPHTX and ETH. However, only the ETH values are determinant. Biotron reserves the right further to accept other alternative cryptographic coins and tokens subject to individual assessment.

ITE principles:
- Private ITE for strategic participants will start in January 2018.
- Public ITE will take place on 27.03.2018 and stay open for 9 days
- Public ITE in 9 rounds. Each day represents one round.
- Each round the token value increases by 10% compared to the initial token value.
- If not all the ERC-20 based BTRN are generated during the ITE, the remaining tokens will be allocated to the user acquisition pool.

Round / Day	1	2	3	4	5	6	7	8	9
Value per token	€0,10	€0,11	€0,12	€0,13	€0,14	€0,15	€0,16	€0,17	€0,18

BTRN Token distribution event structure

Biotron budget

Funds raised will be allocated as follows. To mitigate volatile cryptocurrency markets and to provide Biotron with a runway of 24+ months, up to 50% of raised funds will be hedged in EUR, BTC, and ETH.

Operations
15 %

Marketing
7 %

Legal
8 %

System security
15 %

Development
55 %
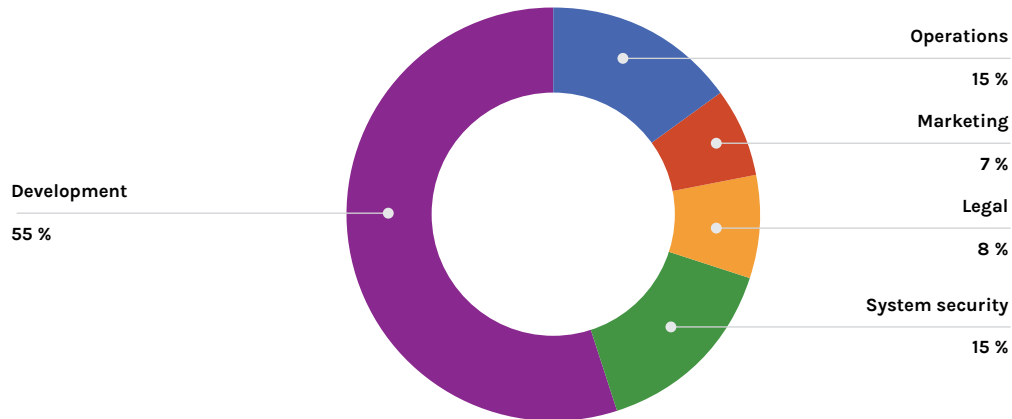
9. Roadmap

The following roadmap presents our past milestones and illustrates the most important actions and the timeline for building applications.

July 2017
Idea and team created

October 2017
BIOTRON FOUNDATION established

December 2017
Seed funding of € 400K secured

September 2018
Testnet launch

March 2018
Public ITE & Proof of concept

February 2018
Official launch & Private ITE

December 2018
Data providers applications

March 2019
Data comsumers applications

The roadmap outlines the high-level initiatives and provides an indicative timeframe for the delivery and readiness of the platform

Glossary

Data set - Data in a specific form containing structured data (e.g. GPS, speed, timestamp).

Data provider/subject/producer - A person or organisation owning devices which produce data.

Data consumer - A person, company, organisation, or institution that is engaged in buying or consuming data.

Data broker - A company or business unit that earns its primary revenue by supplying data or inferences about people gathered mainly from sources other than the data subjects themselves. Companies that collect most of their data directly from consumers are not usually considered to be data brokers

Profiling: The creation or use of inferences about people. Although we focus on inferences that are either made by data brokers or are informed by brokered data, it is important to note that profiling is not the sole province of data brokers. For example, Google and Facebook regularly engage in profiling to target advertisements, often without the assistance of data brokers. Some companies may specialise in profiling and analytics, without actually selling any data themselves.

Anonymisation: The UK's Information Commissioner's Office defines anonymisation as "the process of turning data into a form which does not identify individuals and where identification is not likely to take place".

Pseudonymisation: Pseudonymisation is a procedure whereby any identifying characteristics of data are replaced with a value which prevents the individual from being directly identified. It provides weaker protection than anonymisation - it may still be possible to identify the individual by analysing other related data.

Internet of Things (IoT). IoT refers to the growing network of physical devices that are connected to the internet. From 'smart' home devices to sensors in city environments, IoT devices are expected to rapidly increase the amount of information which is collected, stored, and processed about our surrounding environments.

Personal data - The EU General Data Protection Regulation (GDPR) defines personal data as "any information relating to an identified or identifiable natural person ('data subject'). An identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, online identifier, or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural, or social identity of that person."

PII: Personally identifiable information

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